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WHAT IS THE RIGHT CUTTING CYCLE FOR PONDEROSA PINE?

by

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The rule that frequent light cuts in ponderosa pine produce greater yields has long been recognized by foresters. Analysis of growth by five-year periods in a 35-year-old cutting on the bitterroot National Forest shows how the principle has worked out in this instance.

The mature and overmature ponderosa pine stand in Lick Creek was cut selectively under Forest Service supervision between 1907 and 1911. Thirty-five years later, in 1946, the residual stand was made the subject of a special study. It was found that the intensity of cutting had varied greatly. Hence, the residual stand at the time of cutting could be grouped into four classes. The reserve volume in these classes, and the net growth per acre for 35 years following cutting is shown below.

Volume per acre in residual stand (bd. ft.)	Net growth per acre in 35 years (bd. ft.)	Net growth as percent of reserve stand
627	61	9.7
2396	1239	51.7
4655	3420	73.4
9089	4349	47.8

The increment was not distributed uniformly over the 35-year period. The best growth was made by the moderate and heavy classes of reserve stand during the second five-year period after cutting (Figure 1).

1/ Research Note 55, The growth of selectively cut ponderosa pine in western Montana, gives a more complete description of the stand and growth for the 35-year period.

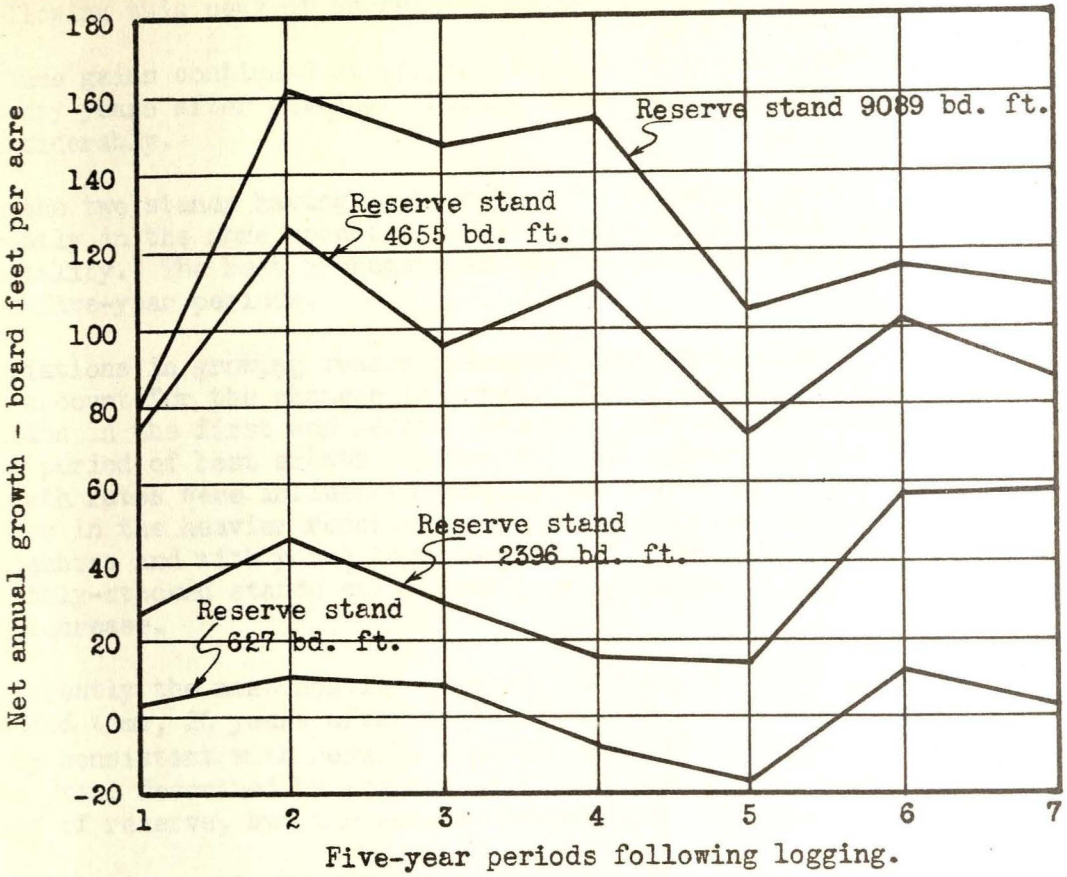

Figure 1. Net annual growth by reserve stand classes and five-year periods.

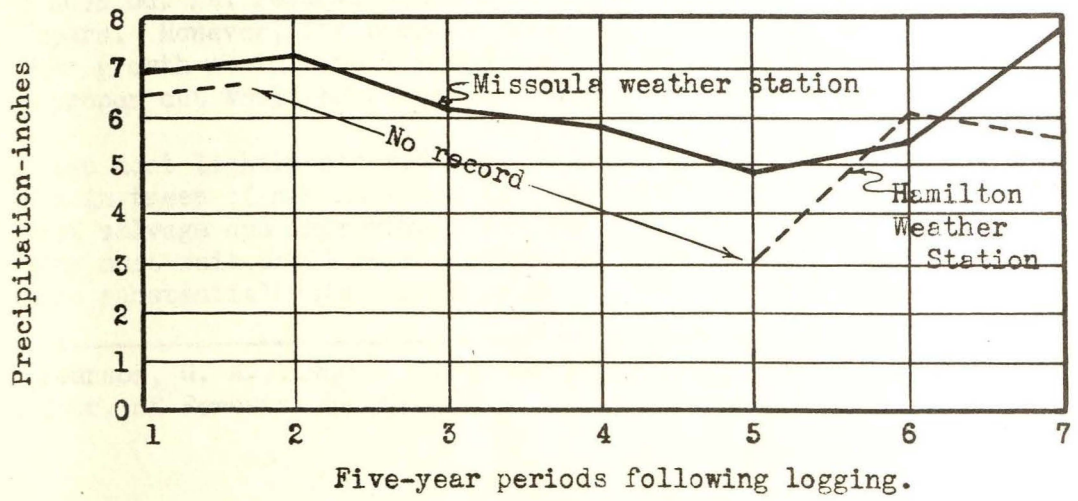

Figure 2. Average growing season (April-August) precipitation by five-year periods.

Following this peak of increment, growth tended to decline.

Volume gains continued at comparatively high rates, however, until twenty years after cutting. During later periods, growth slowed down considerably.

In the two stands having lighter reserve stocking, growth improved greatly in the more recent periods because of ingrowth and decreased mortality. The best increment in these stands was made in the last two five-year periods.

Variations in growing season precipitation (April-August) do not seem to account for the changes in growth rates, although the high precipitation in the first and second five-year periods is associated with the period of best growth (Figure 2). It appears likely that the growth rates were influenced more by the stocking of the stands. The trees in the heavier reserve stands have begun to compete with their neighbors and with young reproduction. On the other hand, the two lightly-stocked stands still have growing space, so growth has tended to increase.

Apparently the most heavily-stocked stand should have been cut a second time, 20 years after the first cutting. The data are remarkably consistent with results reported from the southwest by Pearson 2/. The stand described by Pearson grew at a somewhat better rate in percent of reserve, but the general trends are similar.

It is not possible to determine just what trees and how much volume should have been cut after 20 years, but as a general guide, the cut probably should have roughly equalled the growth, around 3000 bd. ft. The actual cut, of course, should aim to take out the highest risk trees, the poorest producers, and those that have little possibility of responding to release.

The 4655 bd. ft. reserve stand also should have been cut again after 20 years. However, its comparatively light stocking and somewhat slower growth would have limited the cut to a small amount. Probably the proper cut would have been too light to interest practical loggers.

The two most lightly-stocked reserve stands do not have enough growing stock in trees of merchantable size to permit any sawtimber cutting except salvage and improvement for the present or near future. These stands must wait until reproduction has grown to merchantable size before substantial cuts can be made.

2/ Pearson, G. A., 1946. Ponderosa pine in the second cutting cycles. Jour. of Forestry 44:354-368.